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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/477,570	01/06/2000	DANIEL J. KNABENBAUER	AUS990884US1	9429

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EXAMINER	
NGUYEN, KEVIN M	

ART UNIT	PAPER NUMBER
2674	21

DATE MAILED: 03/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/477,570	KNABENBAURER, DANIEL J.	
	Examiner	Art Unit	
	Kevin M. Nguyen	2674	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 January 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,4-24,26 and 28-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,4-24,26 and 28-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The remarks filed on 01/06/2003 have been fully considered but they are not persuasive. The rejections of claims 2, 4-24, 26 and 28-49 are maintained.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 2 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krembs "previously cited" (US 3,585,443) in view of MacFarlane "IDS" (US 5,801,666).

4. As to claims 2 and 26, Krembs teaches as shown in Figs. 1 and 3 the three-dimensional gas discharge display array is formed by a plurality of parallel two-dimensional gas discharge matrices 5 (col. 2, lines 18-20). The electrode pairs formed by glass enclosed wires 1 and 3 are fired through the X-Y-Z display control and power supply 17 (col. 2, lines 42-44). The firing potential of different polarities is impressed on each of the two electrodes associated with a given intersecting point in the gas display array contained in box 7. At the point where these two electrodes intersect the applied voltages add such that the potential difference between the two electrodes is greater than the firing potential. This causes a discharge at this point (col. 2, lines 47-54). That means, different polarities of each the two electrodes at that point perform an anode and a cathode.

Accordingly, Krembs teaches all the claimed limitations except that pixels having a red light emitting element, a green light emitting element, and a blue light emitting element, and a phosphorus material.

However, MacFarlane teaches a three-dimensional display device comprising a plurality of pixels each including red, green, and blue voxels (fig. 2 and fig. 6, col. 6, lines 7-8 and col. 6, lines 23-24). Red, green, blue dye that fluoresce (abstract) perform a phosphorus material.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify each Krembs' pixel including red, green, and blue voxels, in view of the teaching in the MacFarlane reference because this would provide a full color display device with a wide range of visible spectrum as taught by MacFarlane (col. 2, lines 52-64).

5. Claims 2, 4-24, 26 and 28-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mayer et al "newly cited" (US 3,790849) in view of MacFarlane.

6. As to claims 2 and 26, Mayer et al teaches a three-dimensional display (col. 3, lines 26-27) comprising:

computer 12 operates as an interface through which information to be displayed may be input from an external source to the three dimensional monitor system (col. 6, lines 40-43);

aluminum wire, for example, provides a suitable conductor for this purpose which may be suitably anodized (col. 2, lines 43-46). That means, at least two cross aluminum wires at grid 52 or grid 54 or grid 56 have an anode; therefore, if the grid is the anode,

then the other grid has to be a cathode; a gas volume 17, and a phosphorus material (see figure 9, column 6, lines 27-52).

Accordingly, Mayer et al teaches all the claimed limitations except that pixels having a red light emitting element, a green light emitting element, and a blue light emitting element.

However, MacFarlane teaches a three-dimensional display device comprising a plurality of pixels each including red, green, and blue voxels (fig. 2 and fig. 6, col. 6, lines 7-8 and col. 6, lines 23-24).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify each Mayer et al's pixel including red, green, and blue voxels, in view of the teaching in the MacFarlane reference because this would provide a full color display device with a wide range of visible spectrum as taught by MacFarlane (col. 2, lines 52-64).

7. As to claims 4 and 29, Mayer teaches three dimensional panel (col. 3, lines 26-27) comprising aluminum wire, for example, provides a suitable conductor for this purpose which may be suitably anodized (col. 2, lines 43-46). That means, at least two cross aluminum wires at grid 52 or grid 54 or grid 56 have an anode; therefore, if the grid is the anode, then the other grid has to be a cathode. MacFarlane teaches a three-dimensional display device comprising a plurality of pixels each including red, green, and blue voxels (fig. 2 and fig. 6, col. 6, lines 7-8 and col. 6, lines 23-24).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify each Mayer et al's pixel including red, green, and

blue voxels, in view of the teaching in the MacFarlane reference because this would provide a full color display device with a wide range of visible spectrum as taught by MacFarlane (col. 2, lines 52-64).

8. As to claims 5, 6, 7, 28, 30, 31, 32, Mayer teaches three dimensional panel (col. 3, lines 26-27) comprising aluminum wire, for example, provides a suitable conductor for this purpose which may be suitably anodized (col. 2, lines 43-46). That means, at least two cross aluminum wires at grid 52 or grid 54 or grid 56 have an anode; therefore, if the grid is the anode, then the other grid has to be a cathode. This is seen to meet the claimed limitations as follow:

the anode of a one of the pixels is shared by at least one other pixel, recited *in claim 5*; the cathode of a one of the pixels is shared by at least one other pixel, recited *in claim 28*; the anode of a one of the pixels is shared by one or more other pixel, recited *in claim 30;* a face of one of the pixels is shared by another pixels, recited in *claims 6 and 31*; the side of the pixel is the side of the another neighboring pixel, recited in *claims 7 and 32.*

9. As to claims 8 and 33, Mayer teaches three dimensional panel (col. 3, lines 26-27) comprising aluminum wire, for example, provides a suitable conductor for this purpose which may be suitably anodized (col. 2, lines 43-46). This is seen to meet the claimed limitations signal source and power source are positioned in seams between pixels.

10. As to claims 9, 34 and 35, Mayer et al teaches the intersection of anodized glass wires at grids 52, 54, 56 making cubic pixels that would perform as an anode and a

cathode (column 6, lines 1-29 and column 7, lines 3-11). This is seen to meet the claimed limitations an anode bus line is positioned in a seam from a first anode of a pixel to a second anode of another pixel; and a cathode bus line is positioned in a seam from a cathode of a pixel to a cathode of another pixel.

11. As to claims 10-12 and 36-38, MacFarlane teaches a three-dimensional display device comprising a plurality of pixels each including red, green, and blue voxels (fig. 2 and fig. 6, col. 6, lines 7-8 and col. 6, lines 23-24). Mayer teaches three dimensional matrix (col. 3, lines 26-27) comprising aluminum wire, for example, provides a suitable conductor for this purpose which may be suitably anodized (col. 2, lines 43-46). That means, anodized aluminum wires are anode bus line. The anode bus lines makes up the three dimensional matrix, comprising pixels in a seam from a first grid of a red, green, blue pixels to a second grid of another red, green, blue pixels.

This is seen to meet the claimed limitations a first anode of a first red, green, blue light emitting element of a pixel is connected to a second anode of a second red, green, blue light emitting element in another pixel by a straight line bus connection along a seam in any direction in the three dimensional matrix.

12. As to claims 13 and 39, Mayer teaches three dimensional panel (col. 3, lines 26-27) comprising aluminum wire, for example, provides a suitable conductor for this purpose which may be suitably anodized (col. 2, lines 43-46). That means, at least two cross aluminum wires at grid 52 or grid 54 or grid 56 have an anode; therefore, if the grid is the anode, then the other grid has to be a cathode. This is seen to meet the claimed limitations a first cathode of a first pixels is connected to a second cathode of a

second pixel by a straight line connection along a seam in any direction in the three dimensional matrix.

13. As to claims 14 and 40, Mayer et al teaches the intersection of anodized glass wires at grids 52, 54, 56 making cubic pixels, and based on the **Pythagorean theorem** "the theorem that the sum of the squares of the lengths of the sides of a right triangle is equal to the square of the length of the hypotenuse" that would perform equally well with the distance between two adjacent anodes is a square root of two multiplied by a length of one side of a pixel.

14. As to claims 15-18 and 41-44, MacFarlane teaches multiple voxels are arranged to create a three dimensional voxel array. The shape of the voxel array is cubic (col. 6, lines 7-10). The cubic voxel has equal twelve sides. This is seen to meet the claimed limitations the distance between the anode/cathode and the anode/cathode of the first RGB light emitting element and the second RGB light emitting element is twice the length of one side a pixel.

15. As to claims 19-23 and 45-48, MacFarlane teaches computer 12 operates as an interface through which information to be displayed may be input from an external source to the three dimensional monitor system (col. 6, lines 40-43).

16. As to claims 24 and 49, MacFarlane teaches a three dimensional array of optical voxels in a cubic packed configuration other voxels placement geometries may be utilized in this invention (figure 2 and 4A, col. 4, lines 64-67).

Response to Arguments

17. Applicant's arguments filed 01/06/2004 have been fully considered but they are not persuasive.

Response to argument I

In response to applicant's argument that claims 2 and 26 recite "a three dimensional matrix of light emitting elements includes a red light emitting element, a green light emitting element, and a blue light emitting element each of the red, green and blue light emitting elements include a cell having an anode, a cathode, and a gas volume." This argument is not persuasive because Krembs teaches as shown in Figs. 1 and 3 the three-dimensional gas discharge display array is formed by a plurality of parallel two-dimensional gas discharge matrices 5 (col. 2, lines 18-20). The electrode pairs formed by glass enclosed wires 1 and 3 are fired through the X-Y-Z display control and power supply 17 (col. 2, lines 42-44). The X-Y-Z display comprises the light emitting elements are pixels. The firing potential of different polarities is impressed on each of the two electrodes associated with a given intersecting point in the gas display array contained in box 7. At the point where these two electrodes intersect the applied voltages add such that the potential difference between the two electrodes is greater than the firing potential. This causes a discharge at this point (col. 2, lines 47-54). That means, different polarities of each the two electrodes at that point perform an anode and a cathode. MacFarlane teaches a three-dimensional display device comprising a plurality of pixels each including red, green, and blue voxels (fig. 2 and fig. 6, col. 6, lines 7-8 and col. 6, lines 23-24). Red, green, blue dye that fluoresce (abstract) perform

a phosphorus material. Again, this is seen to meet the claimed limitations, as clarify the rejections above.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify each Krembs' pixel including red, green, and blue voxels, in view of the teaching in the MacFarlane reference because this would provide a full color display device with a wide range of visible spectrum as taught by MacFarlane (col. 2, lines 52-64).

Response to argument II

In response to applicant's argument that claims 2 and 26 recite "a three dimensional matrix of light emitting elements includes a red light emitting element, a green light emitting element, and a blue light emitting element each of the red, green and blue light emitting elements include a cell having an anode, a cathode, and a gas volume." This argument is not persuasive because Mayer's invention teaches the three-dimensional display (fig. 9, col. 6, line 27 and col. 3, lines 26-27) comprising, three display grids 52, 54 and 56 are shown in Fig. 9 (col. 6, lines 6-7), a three dimensional panel may be constructed of only two independent grids or more than the three grids

show in Fig. 9 (col. 6, lines 27-29) . Also, the different grids may produce different colors either by use of a different gaseous environment or association with various color phosphors which glow in response to cell discharge (col. 6, lines 38-41). Mayer teaches aluminum wire, for example, provides a suitable conductor for this purpose which may be suitably anodized (col. 2, lines 43-46). That means, at least two cross aluminum wires at grid 52 or grid 54 or grid 56 have an anode; therefore, if the grid is the anode, then the other grid has to be a cathode. MacFarlane teaches a three-dimensional display device comprising a plurality of pixels each including red, green, and blue voxels (fig. 2 and fig. 6, col. 6, lines 7-8 and col. 6, lines 23-24). Again, this is seen to meet the claimed limitations, as clarify the rejections above.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify each Mayer's pixel including red, green, and blue voxels, in view of the teaching in the MacFarlane reference because this would provide a full color display device with a wide range of visible spectrum as taught by MacFarlane (col. 2, lines 52-64).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that claims 4 and 29 recite "the red light emitting element, green light emitting element, and blue light emitting element each have an anode and a cathode. This argument is not persuasive because Mayer teaches aluminum wire, for example, provides a suitable conductor for this purpose which may be suitably anodized (col. 2, lines 43-46). That means, at least two cross aluminum wires at grid 52 or grid 54 or grid 56 have an anode; therefore, if the grid is the anode, then the other grid has to be a cathode. MacFarlane teaches a three-dimensional display device comprising a plurality of pixels each including red, green, and blue voxels (fig. 2 and fig. 6, col. 6, lines 7-8 and col. 6, lines 23-24).

In response to applicant's argument that claims 5, 6, 7, 28, 30, 31 and 32 recite the anode of a one of the pixels is shared by at least one other pixel, recited *in claim 5;* the cathode of a one of the pixels is shared by at least one other pixel, recited *in claim 28*; the anode of a one of the pixels is shared by one or more other pixel, recited *in claim 30;* a face of one of the pixels is shared by another pixels, recited in *claims 6 and*

31; the side of the pixel is the side of the another neighboring pixel, recited in *claims 7 and 32.* These arguments are not persuasive because Mayer teaches three dimensional panel (col. 3, lines 26-27) comprising aluminum wire, for example, provides a suitable conductor for this purpose which may be suitably anodized (col. 2, lines 43-46). That means, at least two cross aluminum wires at grid 52 or grid 54 or grid 56 have an anode; therefore, if the grid is the anode, then the other grid has to be a cathode. Again, this is seen to meet the claimed limitations, as clarify the rejections above.

In response to applicant's argument that claims 8 and 33 recite "electrical connections between the pixels, signal sources and power source are positioned in seams between pixels." This argument is not persuasive because Mayer teaches three dimensional panel (col. 3, lines 26-27) comprising aluminum wire, for example, provides a suitable conductor for this purpose which may be suitably anodized (col. 2, lines 43-46). This is seen to meet the claimed limitations, as clarify the rejections above.

In response to applicant's argument that claims 9, 34 and 35 recite "an anode bus line is positioned in a seam from a first anode of a pixel to a second anode of another pixel; and a cathode bus line is positioned in a seam from a cathode of a pixel to a cathode of another pixel." These arguments are not persuasive because Mayer teaches three dimensional panel (col. 3, lines 26-27) comprising aluminum wire, for example, provides a suitable conductor for this purpose which may be suitably anodized (col. 2, lines 43-46). That means, anodized aluminum wires are anode bus line. The anode bus lines makes up the three dimensional panel, comprising pixels in a seam

from a first grid of a pixel to a second grid of another pixel. Again, this is seen to meet the claimed limitations, as clarify the rejections above.

In response to applicant's argument that claims 10-12 and 36-38 recite "a first anode of a first red, green, blue light emitting element of a pixel is connected to a second anode of a second red, green, blue light emitting element in another pixel by a straight line bus connection along a seam in any direction in the three dimensional matrix." These arguments are not persuasive because MacFarlane teaches a three-dimensional display device comprising a plurality of pixels each including red, green, and blue voxels (fig. 2 and fig. 6, col. 6, lines 7-8 and col. 6, lines 23-24). Mayer teaches three dimensional matrix (col. 3, lines 26-27) comprising aluminum wire, for example, provides a suitable conductor for this purpose which may be suitably anodized (col. 2, lines 43-46). That means, anodized aluminum wires are anode bus line. The anode bus lines makes up the three dimensional matrix, comprising pixels in a seam from a first grid of a red, green, blue pixels to a second grid of another red, green, blue pixels. Again, this is seen to meet the claimed limitations, as clarify the rejections above.

In response to applicant's argument that claims 15-18 and 41-44 recite "the distance between the anode/cathode and the anode/cathode of the first red, green, blue light emitting element and the second red, green, blue light emitting element is twice the length of one side a pixel." These argument are not persuasive because MacFarlane teaches multiple voxels are arranged to create a three dimensional voxel array. The shape of the voxel array is cubic (col. 6, lines 7-10). The cubic voxel has equal twelve

sides. Again, this is seen to meet the claimed limitations, as clarify the rejections above.

In response to applicant's argument that claims 21 and 46 recite "the control system receives an input image coded in a three dimensional coordinate system." This argument is not persuasive because MacFarlane teaches computer 12 operates as an interface through which information to be displayed may be input from an external source to the three dimensional monitor system (col. 6, lines 40-43).

For these reasons, the rejections based on Krembs, Mayer et al, and MacFarlane have been maintained.

Conclusion

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Kevin M. Nguyen** whose telephone number is **703-305-6209**. The examiner can normally be reached on MON-THU from 9:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Richard A Hjerpe** can be reached on **703-305-4709**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered response should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Kevin M. Nguyen
Patent Examiner
Art Unit 2674

KN
March 4, 2004

XIAO WU
PRIMARY EXAMINER